

# Hobbies

## WEEKLY

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## A Straightforward way of MAKING A TOBOGGAN

**S**NOW, being a very uncertain visitor in this changeable climate of ours, makes it very desirable for those liking to enjoy the sport of tobogganing, to have the toboggan ready for it, otherwise, by the time the article is completed the snow may have vanished.

### A Sturdy Article

Of course, some fun can be got out of any rough and ready affair, but a properly made and strong article is much to be preferred. The toboggan illustrated comes about midway, between the crude article, and the expertly built professional affair, and if kept painted, will last some years, and be always ready when the snow does make an appearance. Hardwood, like beech, is

about the best wood to use, but quite a good article can be made from good quality deal.

### Sides and Crossbars

A side view is given in Fig. 1 and an end view in Fig. 2, with suitable dimensions. Cut the sides from wood 1in. thick, and round the bottom corners to a quarter circle. Between the sides three crossbars are to be mortised and tenoned across. The mortises for these are shown in the side view and should be just 1in. square.

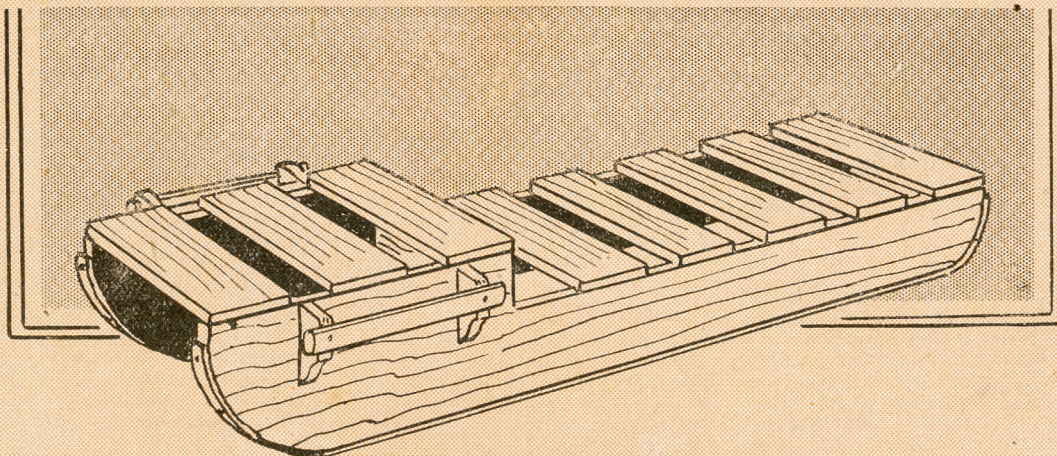
Those at the forepart of the toboggan are cut at a distance from the front of 6ins., and are 1in. from the top and spaced 2ins. apart. At about 1in. from where the sides are reduced in width, cut out a second and identical pair of mortises.

One crossbar goes across near the rear end, about 6ins. from it as a matter of fact, and here a single mortise is cut, 1in. down from the top. The total length of these three crossbars is the same as the outside width of the toboggan. A half view of them is given in Fig. 3, from which it will be seen that they differ in width, the 6in. ones, two of which will be required, being fitted across the wide part of the sides, and the narrower one across at the rear of the toboggan.

### Make Strong Joints

Cut the tenons at the ends to suit the mortises in the sides, naturally. Make a good fit to all and glue them across. Strengthen the joints afterwards with screws to make a sound job.

Now, across the top, nail some 6in.





wide pieces of wood, stout quality, to last well. Space these 3ins. apart, the end ones being level with the ends of the toboggan. All sharp corner edges of these parts should be rubbed off with glasspaper, especially the sawn edges at the sides.

To the sides, foreparts of these, handle grips are to be fitted, for the

to the sides of the toboggan, and the grip, also screwed, across them, resting in  $\frac{1}{4}$ in. grooves cut out of the brackets.

The approximate position for these handles will be where shown in the general view. Glasspaper all the work well and either give a coat or two of varnish or paint, as protection against the weather. If the general appearance is not considered too critically, a good and cheap preservative is creosote.

As constructed, the toboggan will not

both for lasting wear and ease in running, and about the cheapest to use is strip iron,  $\frac{3}{4}$ in. wide and  $\frac{1}{4}$ in. thick. Such metal can be fairly easily bent to the end

#### MATERIAL

Sides (2)—6ft. by 10ins. by 1in.  
Crossbars (2)—1ft. 6ins. by 6ins. by 1in.  
Crossbars (1)—1ft. 6ins. by 3ins. by 1in.  
Top slats (8)—1ft. 6ins. by 6ins. by  $\frac{1}{2}$ in.  
Handles and brackets from scrap wood.

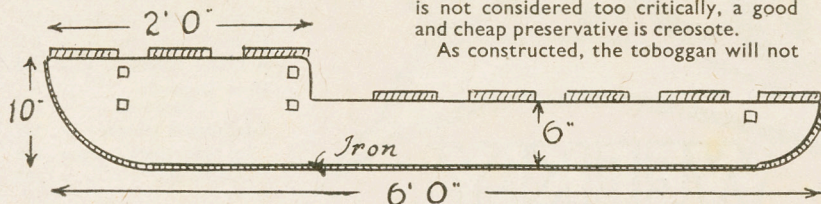


Fig. 1—Side view and dimensions



Fig. 2—End view

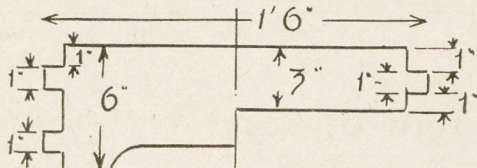


Fig. 3—Half view of crossbars

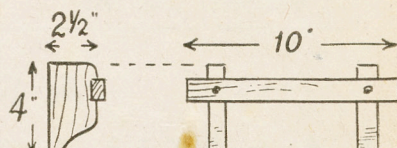


Fig. 4—Handle grip details

tobogganist to grip as he or she travels down the slope. These are detailed in Fig. 4. Cut the grips from hardwood, 1in. wide and  $\frac{3}{4}$ in. thick, and round off all the sharp edges to provide a comfortable grip. The brackets for these are shaped up, as shown, from pieces of 1in. thick wood. They are securely screwed

give the length of service that might be expected unless the sides are shod with metal, though a good substitute is to screw  $\frac{1}{2}$ in. thick strips of hard oak or beech to the bottom edges of the sides, those that come in contact with the snow.

Metal is, however, by far the best,

curves cold, and fixed with screws, well countersunk. Other metal that may be available could also be employed, but iron lasts the longest, and is much the cheapest. When milder weather makes its appearance, and any further chance of snow dwindles away, give the toboggan, when dry, a fresh coat of paint or creosote, and put away ready for the next season. A length of rope, attached to the rear of it, will be helpful when drawing the toboggan up the hill for the next run.

## From The Editor's Notebook—

WILL all readers please give their full name and address when writing to me—or to anyone else, for that matter? You see, I have quite a number of problems sent along where the reader wants a reply in these pages, and is then disappointed because he does not have them. Several reasons prevent me doing it. The query may not be of sufficient general interest to warrant inclusion; I have to plan and prepare these pages a long while before they actually appear. Room is very valuable and has to be filled with articles which will appeal to the greatest number. Apart from all this, readers may be sure of a reply by post, to almost any problem or letter. An answer is sent to them as soon as possible, and then the answer may appear in these pages for the benefit of others. In any case it is impossible to put an answer, as I am so frequently requested, into 'next week's issue'.

I SUPPOSE you have never thought of the time taken just to print this *Hobbies Weekly*—even apart from the time spent in its editorial preparation. Remember, for instance, that the paper for one issue alone would stretch over a hundred miles if the pages were laid end to end! And the fast machines used

in the printing take days to run off the complete issue. Then the issues have to be sent to a distributing centre, from which they are forwarded to all parts of the country to arrive in time for the anxious reader each Wednesday morning. If everyone lived in London this would reduce time considerably, but you must remember readers who live in the North of Scotland, Northern Ireland, etc.—who also expect their *Hobbies*. So you might remember these points, will you, next time you feel disposed to write and ask for something to be put into 'next week's issue'.

I HAVE mentioned before the quaint hobby some people have in making models of Churches and similar buildings from matchsticks. The record must, I think, be held by Mr. T. Willsdon, of 29 West Camp, Cheltenham Road East, near Gloucester, who recently completed his 193rd. Even though he has been doing it for 30 years, an average of nearly seven a year, is not bad going!

THERE certainly is more in bridge building than meets the eye—especially if you make a hobby of collecting details of them. This unusual job is one enjoyed by Mr. E. C. Oakes, the Water Engineer for Preston Corpo-

ration, and he now has a unique collection of pictures, plans, etc., of bridges all over the world. When you think of it, there is an amazing range of them—London's famous bridges, the great arch over Sydney Harbour, the timber lattice bridges of the Canadian Pacific Railway, the weird primitive efforts in Burma, etc. Another suggestion here for readers who like the unusual.

READERS will probably know that the last of London's trams are now on their way out, so gradually a well-known sight will be no more enjoyed—if 'enjoyed' is the right word! Trams will soon become a relic of the past and should, therefore, prove of historic value as a model. In consequence I am having prepared a design of a modern Tramcar which I hope to publish in these pages for readers to make. Be sure to get your copies regularly in order not to miss it!

HAVE you all got your copies of the *Hobbies 1951 Handbook*, because there has been a tremendous run on them. Although 175,000 were printed, I gather that this is not likely to meet the demand, and there is little hope of a reprint when this edition has been sold.

The Editor



# You can entertain and mystify your friends with this XMAS PARTY MAGIC

**A** CONJURER should always be up-to-date and here is, literally, a Trick With A Date. Produce a calendar pad and ask someone to turn to any month and ring round a square block of four dates, as indicated in Fig. 1. Any four can be chosen and the performer does not, of course, know which have been chosen. Yet if the spectator gives him the total of the four numbers, the conjurer immediately tells him the dates selected.

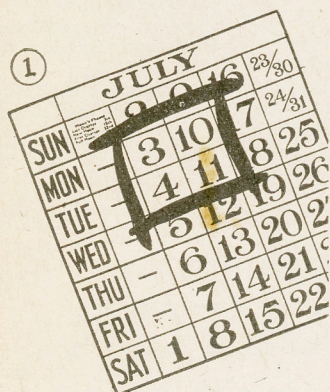


Fig. 1—Marking a block of dates

The secret lies in quite a simple calculation, though it is a wise policy in such cases to convey the impression that the result is arrived at by other means and one must certainly do the calculation mentally.

Of the total given to you (in the present example, it is 28), divide by four (7) and then subtract four (3). This gives the *lowest* of the dates. The next is obviously 3 plus 1=4. Those on the other side of the square block are seven more, i.e., 3 plus 7=10, and 4 plus 7=11 (or, in the latter case you can simply add 1 to the 10).

To vary the proceedings and divert any possible probing into the secret, ask for a three by three block of nine numbers to be ringed off, as in Fig. 2, to give one example. Tell your assistant that you do not want to give him a lot of adding up to do. He can simply add the lowest and the highest numbers in the block and give you the total.

When you have been told this, mentally divide by two, which gives you the centre number, of course (in the present case, 24—2—12). The numbers to the left and right of this will, respectively be 7 less and 7 more (i.e., 5 and 19), whilst the others will be one more and one less than 5 (4 and 6), and the same with 19. Try to visualise a blackboard with these figures being chalked up.

Study the theory of this and then you will see that the first number can also be obtained by dividing the total by 2 and

then subtracting 6. Having obtained this figure (4) add to it 7 and 14, getting 11 and 18. Thus your key figures are 4, 11, 18 and you can, almost in a flash, reel off 4 5 6, 11 12 13, 18 19 20.

## Milko!

The magician puts a large tray on his table (in case of accidents) and on it stands a water-carafe. This he covers with a cardboard tube, shown empty. From a milk bottle he pours the contents into the now hidden carafe. On top

(2)

SEPTEMBER						
SUN	3	10	17	24		
MON	4	11	18	25		
TUE	5	12	19	26		
WED	6	13	20	27		
THU	7	14	21	28		
FRI	1	8	15	22	29	
SAT	2	9	16	23	30	

Fig. 2—Another date trick

juror proposes, magically, to put matters right.

After the usual hocus-pocus, the conjurer lifts off the silk and lifts the plate, raising the cardboard cover. Sure enough the liquids have changed round!

The trick is a chemical one, though there should be no suspicion of this. In the usual old 'wine and water' trick everyone knows that chemicals have been used, but not so in this.

The alleged 'milk' is made by combining a strong solution of calcium carbonate with one of sodium carbonate (washing soda). The carafe, apparently empty, actually contains a little hydrochloric acid ('spirits of salts'). The 'milk' immediately turns to 'water'. That is why the card tube is used.

The 'water' has some photographer's hypo added and in the second milk bottle is a little sulphuric acid. The action in this case is not instantaneous, so there is time to pour first and then cover.

The exact quantities of chemicals must be found by experiment and great care

should be taken that the solutions are safely disposed of and not left about for someone to mistake for genuine milk or water, nor use the bottles in their uncleaned condition. Before being challenged to 'drink it!', get on with another trick! Here is a good one.

## The Fireproof Handkerchief

Display a lady's handkerchief or a very fine scarf. Show that it is whole and perfect. Take a lighted cigarette (your own, or, if not a smoker, one from a spectator). Blow on the end gently to get a bright glow and then boldly stab it on the soft and dainty material. Normally one would expect a very bad burn, since there is no deception (or hardly!). The burning tip of the cigarette actually does meet the material. But, unknown to the audience, the conjurer has brought up a penny and has draped the 'kerchief tightly over it, so that the hot end of the cigarette is stubbed against the metal which not only extinguishes the glow, but conducts off the heat.

Practice on an old scrap of expendable material first. The coin is easily concealed in the hand both before and after the trick.

And talking of coins, here is a useful Coin Vanish which can be done at any time, impromptu, with well turned-back cuffs.

Hold up a penny or a half-crown in the left hand so it is about 9ins. from the

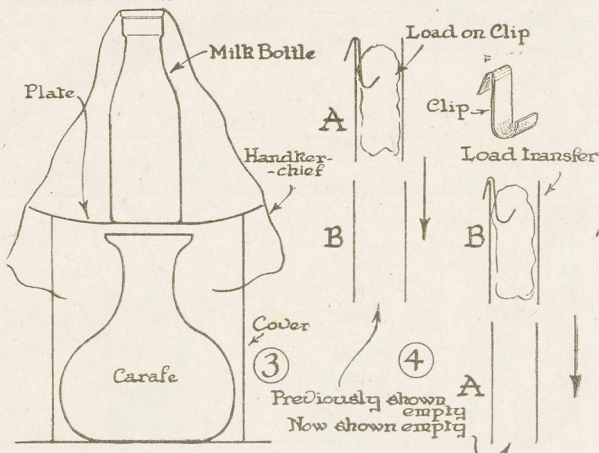


Fig. 3—Milk and carafe parts

Fig. 4—The matchbox trick

outside breast pocket of the jacket. A clean handkerchief is taken by one corner between the first and second fingers of the right hand (Fig. 5). The handkerchief is draped over the coin and left hand, but during this action, the first finger and thumb of the right hand 'steal' the coin and, whilst still holding part of the handkerchief, drop it in the breast pocket (which should be clear of fountain pens, etc.). Possibly, at this



moment, the left hand should be raised a little (Fig. 6).

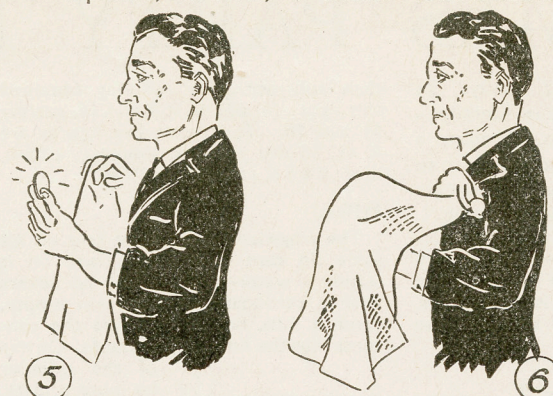
Continue with the draping and gradually move the covered hand away from the body. Do not do it suspiciously quickly nor be in too great a hurry to show that the copper has vanished.

### Where Did It Come From?

Tricks with apparatus obviously made only for conjuring purposes are apt to be regarded with suspicion. In the trick to be described we use the most innocent and simplest of apparatus—just two matchbox covers chosen from various brands so one can pass over another. The larger (B, Fig. 4) is shown quite empty and to emphasise the fact, the other cover (A) is pushed through it downwards. This second cover is also shown quite empty. Yet when the appropriate magic words have been said, a large silk handkerchief is taken from the 'empty' covers.

The handkerchief you will probably have to buy from a conjuring depot as it needs, for proper effect, to be made of very fine silk. A surprisingly large handkerchief of this kind can be packed

into the small compass of the matchbox cover. Should the regular article prove too expensive, however, a smaller



Figs. 5 and 6—The two stages of the vanishing coin trick

handkerchief of more conventional material can be used.

The only other gadget you require is a simple strip of sheet metal (not too flimsy) bent up as shown. This is hooked over the end of the smaller matchbox and

the silk handkerchief packed round it. Experiment is needed to find out how best to do this, as it is important that the handkerchief does not slip from its moorings at the critical moment—now to be described.

The loaded box (A) is passed downwards through the other (B—previously shown empty). As it does so, the overhanging clip catches on the first box and the load is transferred to the 'empty' (?) box just shown. Opportunity should be taken to get the clip to the bottom (by turning the box) as, when finally showing the handkerchief, it will be easier to

conceal the clip.

Before actually revealing the handkerchief, the two boxes should be placed one over the other like an inverted T, letting the audience see through the lower empty box.

## Notes on treatment of distempered ceilings for THE HOME DECORATOR

**W**HEN one is decorating a room, distempering the ceiling can be a most doubtful proposition. New ceilings are more or less easy, but when dealing with a ceiling which has had many coats of various concoctions, one wonders which is the best way to tackle the job. A good workman plans his job

of covering is going to be used. In the past it was usual to make up one's own mixture consisting of whiting, glue size and a dab of blue. This was superseded by manufactured distempers in the form of powders, followed by the more modern oil bound water paints.

These modern water paints, although slightly more expensive (approximate

water paint. It should never be applied to a ceiling which has been previously covered with an unbound distemper without first washing or scraping off all the unbound material. If the unbound distemper is left on it will brush up and mix with the water paint, giving a patchy and uneven surface, calling for a second coat with little better results.

If the nature of the existing covering is unknown, it can be tested by rubbing the surface firmly with the finger. Should there be any tendency for the material to rub off, then the ceiling should be washed or scraped. This may be the hard way, but it certainly pays dividends. The author has tried both ways and the following are the results.

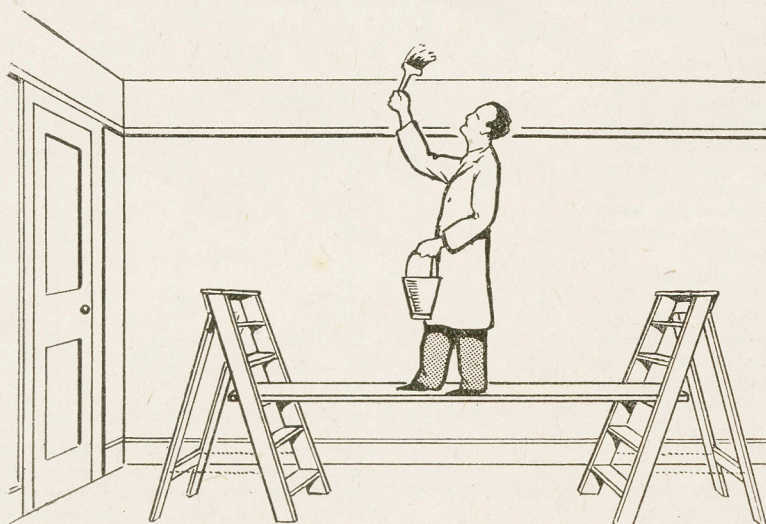
Ceiling A—Lightly wiped over with damp cloth ... ½ hour  
One coat of water paint ... 1 hour  
Second coat of water paint ... 1 hour

Time 2½ hours, cost 8/-, result poor.

Ceiling B—All unbound material washed off with wet cloth ... 2 hours  
One coat of water paint ... 1 hour

Time 3 hours, cost 4/-, result perfect.

From these conclusions we leave the reader to decide on his method of attack. Is he going to work hard and have a good job at less cost, or is he going to work almost as hard, with double the cost and a poor job? (305)



and works to a schedule. The handyman's schedule usually starts Friday evenings and any trouble with the ceiling will soon throw the plan out of gear.

First, it should be decided which type

cost per 10ft. by 12ft. ceiling, 5/- to 6/-, are by far the best in the long run, for when the time comes to renovate the ceiling, one coat of good water paint will give a first class job.

One thing is certain when using



# Have enjoyment and save money with a HOME-MADE DART BOARD

**N**O apology is needed for describing the making of a dart board, for darts is certainly one of the most popular of indoor pastimes. Unfortunately, a full-size board is not cheap to buy, but any handyman can make the one described below at very little cost.

The first essential is a circle of wood of  $1\frac{1}{2}$  ins. thickness. This is not cut from an ordinary plank, but through the thickness of the trunk, so the face and back of the board is made up of what would ordinarily be 'end-grain'. Most timber merchants will cut such a 'butt piece' if asked to do so, but wood at least 1 ft. 4 ins. in diameter should be obtained.

## Elm is Best

If possible, a piece of elm should be selected for the board, for this wood will hold darts firmly without splintering, and, if put in a tub of water at intervals, will swell just sufficiently to close the holes made by the darts.

Having obtained the wood, tap a fine nail into the centre of one face, and, with a pencil held in a looped string of 8 in. radius, draw a circle to mark the outside of the board (see Fig. 1). Then, with a mallet and chisel, work round the outside of the pencil line to reduce the wood to its proper circular shape, keeping the sides of the board perfectly upright.

## The Circles

The next step is to mark out the scoring circles in pencil. The looped string and pencil is again used for this, and six circles are needed, these having a radius of 6 ins., 5  $\frac{1}{2}$  ins., 3  $\frac{1}{2}$  ins., 3  $\frac{1}{4}$  ins.,  $\frac{3}{8}$  in. and  $\frac{1}{4}$  in. (see Fig. 2). These pencil markings should be made fairly heavily, so they will be easy to follow when the wiring is being done.

The centre nail should then be withdrawn and the spokes that mark the different scoring beds are pencilled in. The easiest way of marking these is to set a pair of dividers to  $1\frac{1}{2}$  ins. and to 'step out' this distance round the outside circle. Draw lines from these points towards the centre point, but stop short at the  $\frac{3}{8}$  in. radius circle.

Alternatively, the lines can be marked out with a protractor, being drawn so an angle of 18 degrees is made between adjacent lines. Fig. 3 shows the board after all marking out is finished.

## Wiring

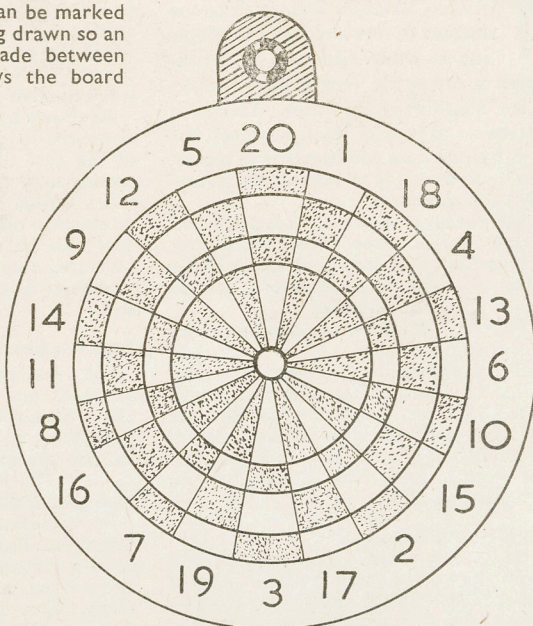
The board is now almost ready for wiring, but before actually starting work on this, a few small nails should be tapped into the board at intervals around the various circles. These nails should be placed alternately just inside and outside the pencil lines, so they will hold the wire exactly on the marking.

To conform to the rules of the game, wire of No. 17 gauge must be used throughout for the wiring. Approximately 22 ft. of this is needed in different lengths, but its cost is not great.

A length of the wire is taken, one end of it is filed to a sharp point, and it is then bent down at right-angles to make a prong  $\frac{1}{2}$  in. in length. This prong is tapped into the wood and the wire carried right round the circle (passing between the guide nails as necessary) and back to its starting point. Here it is cut off to length, but again a  $\frac{1}{2}$  in. long sharpened prong is made, so this end of the wire can also be tapped into the wood.

It is very necessary that the two ends of the wire should meet as closely as possible. If the worker is handy with a soldering iron, it is a sound idea to measure off the required length of wire, make the two prongs, solder them together and tap them into the wood simultaneously, relying on the guide nails to get the circle of wire into its proper position.

All circles must be wired in the same way, and then the spokes can be put in. These spokes are  $6\frac{1}{2}$  ins. long overall.



with a  $\frac{1}{2}$  in. long sharpened prong at each end, the prongs being bent over at right-angles with the pliers. They are simply tapped into place to cover their pencil markings, and again guide nails can be put in to help to get them in the right position.

## Stapling

When all the wiring has been done, the guide nails can be pulled free. The whole of the wire is lightly hammered down so it is in close contact with the wood.

A supply of very small staples is then made up from odd scraps of wire, the ends of these staples being sharpened with a file. These staples are used to hold the spokes firmly in place, two staples being used to each spoke. One staple is put over each spoke just inside

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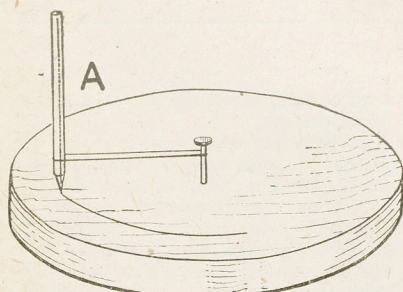


Fig. 1—Marking the circles

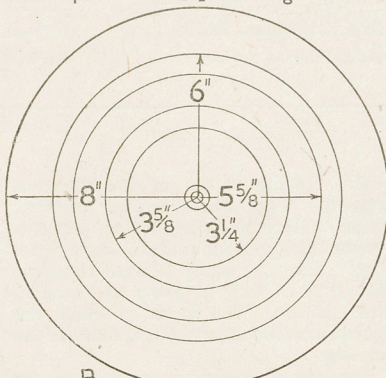


Fig. 2—Diameters of circles

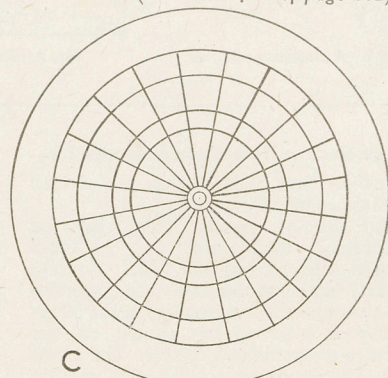


Fig. 3—The completed wiring



# Simple apparatus to make when undertaking HOME CHEMISTRY

**T**HIS new series on Chemistry by the amateur covers a number of simple 'tricks' which can well be introduced at any party. First of all, however, it is a question of apparatus. This need not be an expensive item, however, for as explained here and in our first article, much can be made at home from everyday odds and ends.

The cheapest condenser costs 4/6, yet with a straight adaptor (cost 9d. to 1/-), two corks, a length of glass tubing and a piece of wide metal pipe, one can be rigged up, as shown in Fig. 1.

The metal jacket (which may be of iron if aluminium, copper or brass is not available) should have an internal bore of 1½ ins. to 1¾ ins. Cut off a 2ft. length with a hacksaw. Select two sound corks to fit the ends and with the cork borers make two holes in each, one for the condensing tube, the other for the water supply tube.

## Making a Condenser

Insert the adaptor in one cork and join it to the glass tubing with a piece of indiarubber tubing; press in the water outlet tube and slip the whole into the jacket, pressing the cork tight.

Into the other cork press the water inlet tube, slide the cork up the condenser tube and press tight. If the jacket is of iron, dismantle and dry it in the domestic oven after each use to minimise rusting.

A calcium chloride tube for drying gases is quickly made from a test tube

or a length of wide glass tubing, as shown sectionally in Fig. 2. Select sound corks which fit the tube and before boring, squeeze well to soften them, as this will make them fit gas tight.

As shown by the arrows, the gas passes down the long glass tube to the bottom of the test tube and then is dried by passing over the calcium chloride to the short outlet tube. In the other the direction is one-way. The test tube type may also be used vertically with concentrated sulphuric acid, the gas in this case being dried by bubbling through the acid.

## Beehive Shelf

For a beehive shelf take a tin 3½ ins. in diameter and scribe a line all round 2½ ins. from the bottom. Cut round this line. Next cut out an inverted U-shape to take the gas delivery tube, and then make a ½ in. hole in the centre of the base part of the tin, as shown in Fig. 4.

A pneumatic trough is another expensive item, but an enamel wash bowl is just as efficient. If you have no spare bowl, a half size biscuit tin will serve. Give it several coats of paint to waterproof it. Failing a biscuit tin, make a wooden box of similar dimensions, paying particular attention to the joins and then paint it well inside.

## Gas Jars

Gas jars exist ready made in all homes—common jam jars. The 1lb. size is most useful. One or two should be kept in stock with ground edges for experiments where you need to keep the gases for a short time by closing them with a greased glass plate. To grind the edges flat, use first a paste of sand and water, rubbing with a circular motion on a stone flag, then coarse emery and

water and finally fine emery and water.

If you have a 10ccs. or 25ccs. graduated pipette, you can with its aid, make useful measuring cylinders. A 100ccs. and a 250ccs. are the most used, so hunt out two tall cylindrical bottles which will hold a little more than these volumes. Start with the 250ccs. bottle, setting it on a level surface.

## Marking Off

Stick on a narrow label vertically and drop in 10ccs. of water from your pipette. Carefully mark the level on the label by means of a horizontal line and also write on the number of ccs. Continue adding and marking 10ccs. at a time until you reach the 250ccs. mark. Varnish the label to waterproof it. The 100ccs. measure is made similarly, but graduated in units of 5ccs.

If you have access to a glazier's diamond you can scribe a scale direct on the glass, of course, and dispense with the label.

For a filter funnel stand a tall tin of the press-lid type can be adapted. Cut a hole in the lid to support the funnel. Then cut out a large section (almost half of the circumference) from the side to accommodate the receiving vessel, as shown in Fig. 4. Cut down to the bottom, but leave a ½ in. to 1 in. band at the top to give rigidity. If the receiving vessel is too low when filtering, raise it by slipping a small wood block under it

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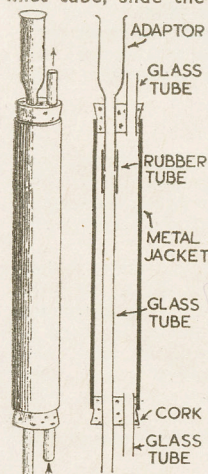


Fig. 1—A cheap condenser

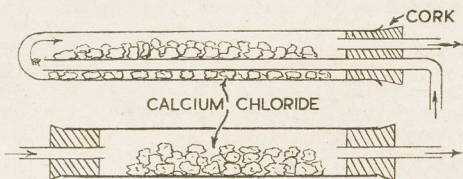


Fig. 2—Simple gas-drying tubes

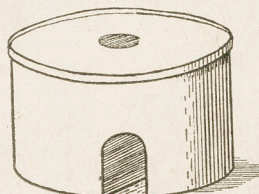


Fig. 3—Tin beehive shelves

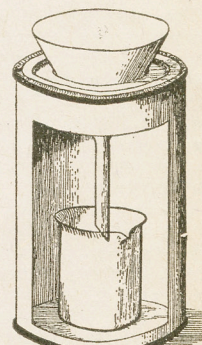


Fig. 4—A funnel stand

## Dart Board—(Continued from page 181)

the 5½ in. and 3½ in. circles, and driven well down into the wood.

All scoring spaces must then be coloured, using two very distinct shades, such as red and blue. A good quality flat paint should be used, and the colours put on the scoring areas alternately in the manner shown on the picture of the finished board. The wood outside the outer scoring ring can be painted black or white as desired.

The scoring values of the different segments have then to be marked. These figures can be painted on, but it is customary to use numbers made from wire. They are easily twisted to shape with a small pair of pliers and stapled into position. The order in which the figures must be arranged is shown on the drawing.

The actual board is completed by screwing a hanger to the back, and only

a set of darts is needed before it can be taken into use.

Darts is very much a game of skill and the actual darts must be balanced to a nicety. For this reason home-made darts are rarely very successful, but having made his own board so cheaply, no player will grudge the half-a-crown or so that is necessary to buy a good set of well balanced brass darts.

(294)



# For canteen, hostel, club or hotel this is a useful LETTER BOARD

WE have had requests from workers for a letter Board or Rack which would be suitable for a club in which they are interested. Now, such a board should be strongly made and nicely finished. Regarding size it is hardly possible to lay down any hard and fast rule, and most likely the board would be made to suit some particular wall space.

## Useful Size

The board here described is of a very useful size, being 21ins. high and 15ins. wide. It is intended in the following notes to give four methods of framing and finishing the board. Plywood  $\frac{1}{4}$ in. thick is suggested as being most suitable, but should this be unobtainable, then one of the many kinds of composition board will answer equally well.

The simplest way of finishing the board is merely to cover it with a piece

edges of the board, as shown at the top of diagram Fig. 1, and to the suggested pattern given in the picture of the finished board.

The second method of finishing the board is shown in Fig. 2. Here the baize is cut the same size as the board, and tacked closely along the upper edge of it. On top of the baize and on all four sides and flush with the edge of the board are fixed strips of wood about  $\frac{1}{2}$ in. or  $\frac{3}{8}$ in. wide by  $\frac{1}{4}$ in. thick.

Small countersunk or round-head screws will do for fastening these strips, which should be neatly mitred at the corners. Around the outer edge of the board screw four edging fillets consisting of  $\frac{3}{8}$ in. by  $\frac{1}{4}$ in. strips, which have their top edges neatly rounded off and their ends mitred, as shown in the figure and the enlarged detail in Fig. 2.

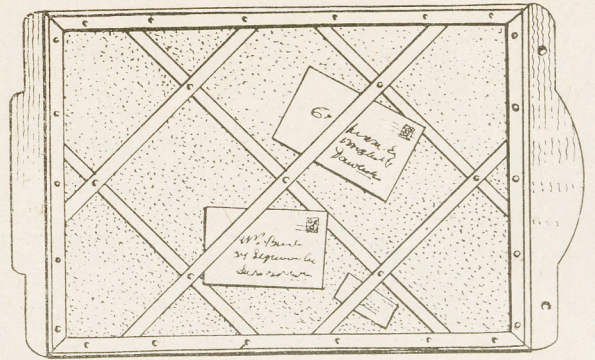
This method makes a very strong and neat job, but it should be mentioned that if cross tapes are required, then these should be put on before the narrow  $\frac{1}{4}$ in. or  $\frac{3}{8}$ in. fillets are secured.

## Frame Effect

More of a picture-frame effect is obtained by the third method, Fig. 1 (D). The board is covered with the baize, and a solid rebated moulding is used, and is fixed by running screws obliquely through the moulding into the backing board. The moulding suggested is an ordinary deep tray moulding obtainable at almost any good woodworking supplies shop.

Careful measurement will need to be taken, however, in preparing the mitres on the ends of each length of moulding. The inside measurement of the moulding, that is, the rounded edge which fits down upon the baize, should measure  $\frac{1}{2}$ in. less in length in every case than the edge for which it is intended.

In the fourth method the moulding is solid and not worked with a rebate. The board is covered with the baize, the edges being also covered with the baize and "brought underneath the board and tacked from the back, see Fig. 1 (C). This gives a very simple and strong board, but as the moulding is a little deep, it may not be suitable for all cases. It certainly stiffens the main backing board, which, if of rather large measurements, is of a de-



cided advantage. Always remember to make holes with a suitable awl before inserting the screws. This will prevent the wood from splitting.

## Tape Fixing

A suggestion may be carried out when securing the tapes on the face of the board. A number of celluloid discs, the number required in the case under review being seven, should be cut about  $\frac{3}{8}$ in. in diameter and a hole made in the centre through which will pass the round-head screws.

The woodwork should be lightly glass-papered and given a coating of clear varnish. Ordinary oil paint would, of course, make a good and suitable finish.

It will be noticed in our illustration of the finished article that we have included shaped rails to the top and bottom of the board. This is, perhaps, a purely decorative addition, but it does, at the same time, help to stiffen the board for hanging.

Each rail should lap down on the board a distance of from 1in. to 1 $\frac{1}{2}$ ins. and be screwed securely with countersunk screws. If the rails lap as suggested 1 $\frac{1}{2}$ ins. down on the board, then the upper rail

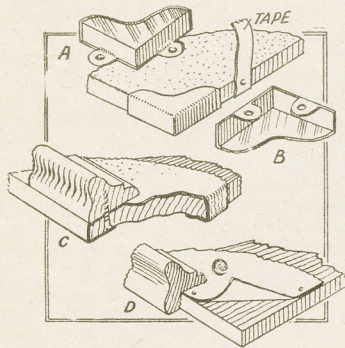


Fig. 1—Details of corners and types of edging

of green baize, cut 1in. larger all round than the board itself and nailed at the back with small tacks. The corners of the baize should be cut across, lapped and nailed and four nickel-plated mirror clips screwed to the back, as Fig. 1.

The clips, as purchased, have their lugs or screwing eyes turned outwards as (A) in this diagram, and to make them fit the corners, these lugs will require to be bent inwards as (B)—a little job that can very easily be done with a pair of pliers. The diagram (B) shows the clip inverted, the better to illustrate how the lugs appear when bent ready for fixing.

## Fitting the Baize

In tacking down the baize, lay this upon the bench or table with the board placed centrally upon it, meaning there must be an equal margin of baize all round. Draw one edge over and tack it securely, the tacks being not more than about 1 $\frac{1}{2}$ ins. apart. Now draw over the opposite side margin of baize, and tack this down. Finally draw over the two remaining edges and make it all secure.

The letter tapes are nailed to the

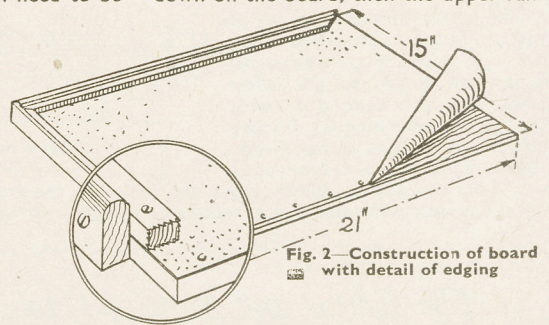


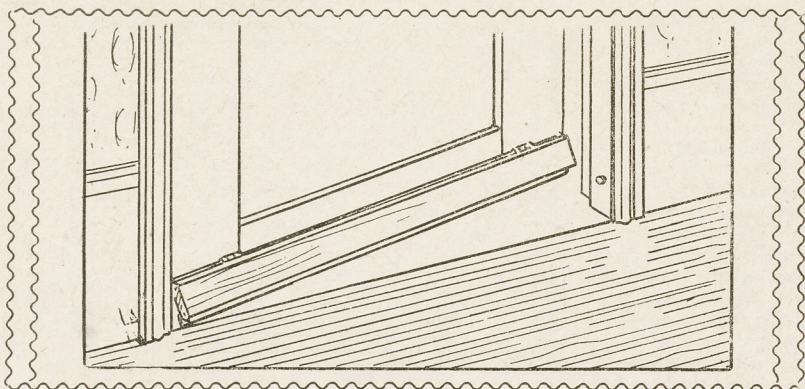
Fig. 2—Construction of board with detail of edging

would measure 4ins. in width, and the lower one 3ins.

Remember, by the way, that all the woodwork must be glasspapered clean and given whatever finish you desire, before the cloth backing and tapes are added. You can stain and polish in the usual way or give a coat of clear varnish to the wood, or even paint.



# Any door can be fitted with this automatic DRAUGHT EXCLUDER



**A** VERY handy affair this, putting an effective stop to those annoying draughts which find their way through the space between the bottom of the door, and the floor. It is quite a simple gadget, and can be made with strips of wood, and a little patience. It is so constructed that, when the door is opened, it rises and does not catch against carpet or other floor covering, dropping again to exclude the draught directly the door is shut.

## Simple Mechanism

The mechanism is very simple, with nothing to go wrong, unless the spring breaks, and then it is no trouble to fit a fresh one whatever. It should be fitted to the outside of the door. Two strips of wood are required for the fitment, as are detailed in Fig. 1.

Cut from  $\frac{1}{2}$  in. thick wood, any kind available, though a hardwood, like oak or beech, would be better than deal for wear. Cut the strips  $\frac{1}{4}$  in. less in length than the width of the door, measuring the latter on the outside when closed, as the distance wanted is that between the jambs.

The outer of the two strips has a small bevel worked along the top and bottom outside edges. It is then hinged to the other strip, the narrower one, with 1 in. iron backflap hinges. Choose hinges which work rather freely, stiff ones might put too much strain on the spring which raises the outer one clear of the floor. Cut recesses

for the leaves of the hinges in both parts so that they close together, leaving no gap.

Necessary details of further construction are grouped together in Fig. 2. In the narrower strip, which is the one to be afterwards screwed to the door, cut a recess, as shown at (A), exactly in the centre. This recess is  $\frac{1}{4}$  in. wide and  $\frac{1}{4}$  in. deep, and about  $\frac{3}{4}$  in. long.

At the top of the recess make a hole with a bradawl, in which one end of the spring can fit. Make this hole at a downward angle, as indicated by the line (a-b) in (B). This detail shows the spring in position, and how it keeps the draught excluder up until pressed down as the door closes by a catch.

## Making the Spring

The spring (C) can be made from a 2 in. length of steel springy wire. Bend  $\frac{1}{4}$  in. of the ends of this at opposite right angles, as seen in the drawing. Insert the bent top end in its hole, and make a second

of the spring can be inserted. Make sure the spring is strong enough to force the part up promptly, when released from the retaining catch by the door being opened.

To the rising piece, at the bottom, a strip of felt or rubber should be nailed, where shown at (D) to press upon the floor. A length of an old cycle or motor car inner tube, would be excellent for this part. It should, if thin quality, be bent double and nailed along to extend  $\frac{1}{2}$  in. below the wood.

Now raise the front part, and in the narrower back strip, bore screw holes for fixing to the door. Well countersink these screw holes for the screw heads to lie slightly below the surface and form no obstruction to the rising part closing properly down. Finish the work either with a coat of varnish or paint, to match the door, as preferred.

## The Catch

For a catch, almost anything suitable in the junk box will suffice. It is really a stud, so fitted to the jamb of the door as to catch the draught excluder and press it downwards as the door closes. Its position is shown by an arrow in Fig. 3, a diagram showing the door closed and the draught excluder kept down by catch.

A really good one can be made with one of those brass cups, familiar to the wireless fan, which are used to hold the crystal. The hole is reamed out enough to admit a small wood screw for fixing the cup about where shown.

To fix the article. Place it against the door, when closed, and press the rising piece well down to the floor. Now run a pencil along the top as an indication where to screw it. Let the excluder rise, then lift it right up and screw the rear

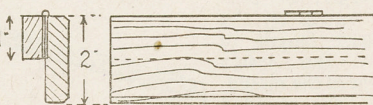


Fig. 1—End view of wood

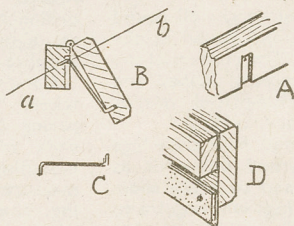


Fig. 2—Details of fittings

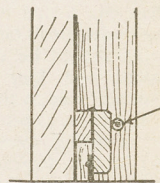


Fig. 3—The catch

hole in the draught excluding part of the gadget into which the opposite bent end

part to the door, touching the pencil line.

See the end of it just touches the jamb on the hinged side of the door, the other end will then be  $\frac{1}{4}$  in. short of the opposite jamb and so should not rasp against it as the door is opened. See this part is A1, and if any rasping does take place, file the edges of the wood until it passes the jamb freely.

Now fix the catch in the position shown and try the action. All being well, as the door closes the catch will force the draught excluder down to the floor and effectually stop any wind from entering the room.

*The Editor and Staff of 'Hobbies Weekly'*

*send Hearty Christmas Greetings*

*to all Readers*



# Novelty Toothbrush Holder

THE extreme importance of teaching children to look after their teeth is realised by all parents. The proper use of a tooth brush cannot be learnt too early, and anything that attracts the child's attention to this article is to be commended.

This teddy bear tooth brush holder shown, finished in bright colours, cannot fail to do this, and will make an attractive present for any child. It is quite simple to make from a few pieces of wood, and a full size pattern is shown.

It is possible to construct the holder practically from odds and ends left over from other jobs, since none of the dimensions is critical. Moreover, only three pieces of wood are required. You need a piece of ply roughly 5½ins. square for the figure. A base piece is wanted 5½ins. long and 2ins. to 2½ins. wide, and should be about ½in. thick to give weight, so the holder stands securely. A small block of wood is also required about ½in. thick, to form the brush holder.

The idea is to arrange the brush so it appears to be held by the teddy. This is accomplished by supporting it in a slot cut in the base, and also with a block glued over this slot.

First, it is necessary to cut out the teddy bear figure, using the full size pattern.

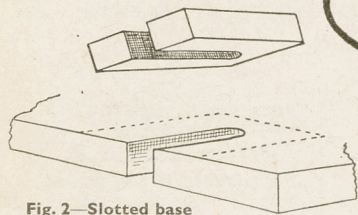


Fig. 2—Slotted base and block

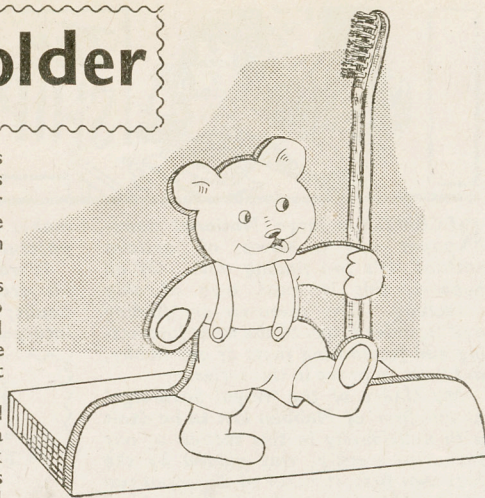
Next, a rectangular piece of wood is cut for the base, the exact length of the base of the figure and 2ins. to 2½ins. wide. A slot to support the brush is then cut in the front of this base piece, so that the brush is at right angles to the figure which appears to hold it in its hand.

The best position (see Fig. 1) is found by trial, since the handles of various makes of brush differ in size. It will, therefore, be necessary to obtain the brush before cutting is begun.

The hole may be cut by means of a fretsaw and finished off to shape with a small file. It should be of such a size that the handle of the brush slips in easily, but without wobbling about.

To give the brush additional support, a similar slot is cut in a small block of wood. This block should be about ½in. thick, its width and length being governed by the slot that has to be cut in it. This is then glued to the back of the figure and also to the base piece, so that it covers the previous slot exactly (see Figs. 2 and 3).

After glasspapering the finished holder, it should be painted in gay colours. The small pots of enamel obtainable are ideal for this purpose. A suggested colour



scheme is to have the teddy bear yellow, the trousers red and the ground green.

Lines between the colours and the features should be put in afterwards in black with a fine brush. A touch of white in the eyes on the nose, and a little red on the tongue, will complete the front.

While painting, do not forget the edges of the figure, which should be

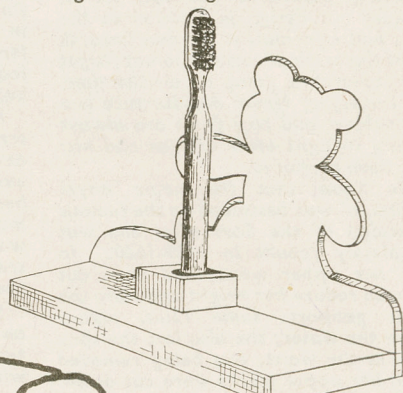


Fig. 1—A rear view

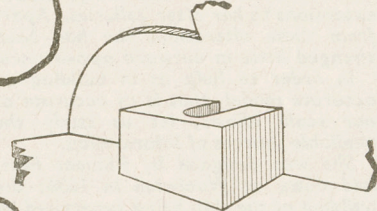
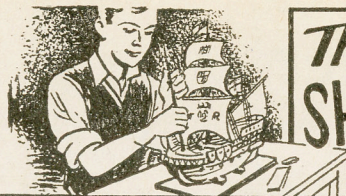


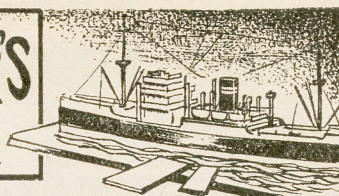
Fig. 3—Back guide block

done at the same time in corresponding colours. All that now remains is to give the back and base, not forgetting underneath, a coat of some suitable colour, and the job is complete. (321)





# The SHIPMODELLER'S Corner



**R**ECENTLY a large National newspaper ran a series of articles entitled 'It's fun finding out'. Of all hobbies, this is most true of ship modelling. The research or 'finding out' is, indeed, one of the most interesting and fascinating facts of our hobby, as I hope to prove in this series.

My choice of the 'Royal Sovereign' as the first of Hobbies kits to be dealt with individually in this section of our favourite weekly, was guided by the fact that first, it is out of the usual run of ship kits; secondly, it is an ideal choice for illustrating the steps that result in the model that presents a real picture of the original ship that inspired our kit and design, especially for the beginner. Later articles will also be included for the advanced modeller and also the modeller of more modern types.

Having purchased our kit, let us consider our design in relation to the facts and information we can unearth about the original vessel. Do not forget that research is going on all the time. The history of Naval Architecture is a vast subject and new facts are always coming to light after designs and kits have been prepared.

We know that the name 'Royal Sovereign' was bestowed on the famous Sovereign of the Seas after she was completely rebuilt in 1659-1660. In 1651 her upper works had been cut down to reduce her height and raise the lower gunports some 12ins. higher above the water; she also lost the spar deck in the waist, this being removed when her upper works were cut down.

After her complete rebuild in 1659-1660 she had lost the old-fashioned extensions to her after galleries. Apart from these alterations she had been changed little in outward appearance. In order to help us in building an accurate model, that is as accurate as our scale allows, let us study the available sources of information.

She was designed by Phineas Pett; laid down at Woolwich in 1636; the building of the ship being supervised by Peter Pett, son of Phineas Pett; finally being completed and launched on October 13, 1637.

She was so expensive to build that the 'Ship Money Taxes' imposed to build her and other ships, laid the foundation of Charles I overthrow and death.

One source of valuable information and detail is John Payne's engraving of this vessel. It was for a considerable time doubted if this engraving actually depicted the Sovereign, but the discovery of a Naval Manuscript giving details of 'Royals' fore-mast and main-mast and topgallant sail on mizzen,

makes it reasonable to accept Payne's portrait of her as fairly accurate.

It was the provision of these sails in his drawing that caused it to be in doubt; these particular sails not coming into general use until nearly 150 years

## Building the Galleon 'Royal Sovereign'

by 'Whipstaff'

later. The discovery of the above document proved that the Sovereign in sail plan was over a century in advance of her time.

A second source of information is the famous document describing the vessel in detail and published by Thomas Heywood in 1637, the year of her launch. A copy of this document is before me as I write.

He goes into great detail in describing her elaborate carvings; gives details of size. Length by keel 128ft.; extreme length from fore-end of beak-head to after-end of stern approximately 232ft. Main breadth was 48ft.; tumble home extreme; height from keel to the top of lanthorn 76ft.

She had five lanthorns and the largest would hold ten people standing upright without being actually crowded one against the other.

Her decks consisted of three flush decks, fore-castle, half-deck, quarter-deck, and she had a round house.

Portholes were pierced as follows: 30 in lower tier, 30 in middle tier, and 26 in the upper tier. This, of course, means half that number on each side of the hull.

Tons and tonnage were 1,522 tons, burden 1,141 tons, depth in hold 19.3ft. and actual draught 22.2ft.

Heywood stresses the fact that there was no colour about her except black and gold.

Let us now assemble our facts:

- I. She was elaborately carved. Now we cannot copy these carvings in detail at the scale of our present model, but we can achieve the effect of this magnificent scheme of decoration.
- II. We know we can use our Hobbies

design of fore-castle and three decks, because we know that at the time that our design represents her, she had been cut down in her number of decks.

- III. It is now reasonable to accept Payne's portrait of her to be fairly accurate and can proceed to rig her as was the custom in the days of the spritsail-topmast.

The 'Royals' can be added or not according to personal taste. The spars for these sails are included in Hobbies design.

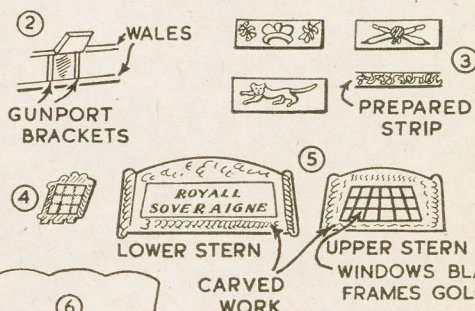
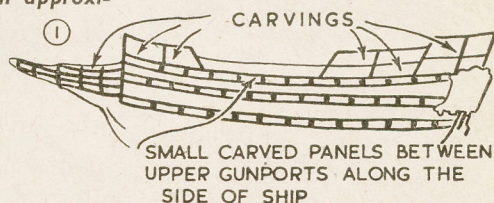
Our rigging, of course, will be simplified. To try and depict the full involved rigging of this period on a model to this scale is not necessary, nor is it desirable.

One of the greatest gifts the ship modeller can cultivate is the gift of knowing what detail to include and what to leave out in the particular scale to which he is working.

We will choose sufficient rigging to give an authentic picture of the rigging of the period, and to achieve a model, that in its rigging, will look right.

Now proceed to cut out your parts for the hull and assemble and carve it as usual.

Your fore-castle, half-deck and



quarter-deck, before being glued in position, will be much improved if cut, the aft end of the fore-castle and forward-ends of the other two decks, into three gentle curves, as in Fig. 6. These bulkheads were in this shape on the Sovereign and many other ships.

On the Sovereign they were elaborately carved and gilded, but on this small scale it will be sufficient to paint them in tiny patterns of black and gold.



Having assembled your hull, make two temporary gunwale pieces of card and pin in position. Having done so, use dividers to mark off the centre of every gunport; the gunports cut in your temporary bulwarks or gunwales will act as guides for positioning.

This done, make a template of stiff card to the size of your gunports on your Hobbies painting plan. In the exact centre pierce it with a fret-pin. By placing the point of this pin in centres you have marked with your dividers, you can draw around the template with a sharply pointed pencil, thus assuring each porthole is correctly placed and all of the same size.

Do not be content with painting your port-holes on the hull, sink them in about  $\frac{1}{8}$  in. to  $\frac{3}{16}$  in. in depth; this is quite easy if you use a chisel  $\frac{1}{16}$  in. less in size than the square of your finished port. This is a great improvement and gives the real effect of the hollow hull.

On consulting our engraving we find that the Sovereign had six wales per side, the lower actually ran through the centre of the lower row of ports and had to be cut through for each port, but for our small model we will run it along the lower edge of the ports.

Use Bristol board, veneer or  $\frac{1}{32}$  in. ply and cut several strips  $\frac{3}{32}$  in. wide. Glue and pin these in position to represent the wales, placing them to run along the upper and lower edges of the ports, as in sketch (1); the heavy lines are the wales.

Glue and pin wales to the beakhead, as shown in the sketch also. Now, using similar strips, panel out your bulwarks, following the heavy lines in sketch (1), thus dividing the upper works into sunken panels, later to be filled with our imitation carvings.

Our next operation will be to affix the gun-port brackets. On the actual ship they were carved shapes, but for our little ship we will be content to insert straight strips  $\frac{1}{16}$  in. wide on each side of each port between the wales, see sketch 2.

Small squares of thin  $\frac{1}{32}$  in. ply are cut to the size of the gunports to make our port lids; these can be glued in open position above the portholes.

In packing kits, as in every other activity of life, mistakes can sometimes occur. On one occasion I found the large guns supplied to be actually of larger size than the gunports through which they were supposed to operate. If this occurs with any model, do not enlarge the gunports. Overscale gunports spoil the effect of any model.

Instead, either turn your guns down to correct size or make a fresh set from dowel rod. In our present model our gunports are barely  $\frac{1}{4}$  in. square, so have your guns  $\frac{3}{16}$  in. in the widest diameter, so that when pinned and glued in your hollowed-out ports, there is a slight clearance all around; it is these small details, simple though they are, that help to produce that authentic appearance.

Along the upper sides between the ports of the top tier were oblong

panels containing carvings; sketch 3 shows three of the designs on the panels of the original vessel. Spaces between beakhead wales were also carved.

Having completed our hull, let us proceed to capture that effect of beautiful carvings on the upper works.

Take one panel at a time, smear over it a little liquid glue, place on it a small portion of plastic wood and work it into a design or merely rough it up, using a gramophone needle mounted in a handle made from dowel rod.

A thin coat of plastic wood (about  $\frac{1}{32}$  in. or it will be overscale), and do not fill each panel completely. To avoid monotony and more faithfully depict the actual carved work, leave small irregular portions of the panel in the corners and at the edges, varying each panel. The portions left bare, though tiny, are to be painted afterwards antique brown with a small pointed brush.

Your tiny panels for in between the upper ports are better prepared on a strip of cartridge paper and afterwards cut to size with a razor blade; see sketch 3.

Now proceed with the stern work. The upper stern should be patterned in the centre with very narrow strips of card in window effect, or you can cut tiny windows out of a piece of Bristol board and glue on. Around this decorate with plastic wood as for your panels; see sketch 5.

The lower stern we decorate with plastic wood around the edges, leaving a centre panel for our name plate.

The side overlays are decorated in the same manner to form windows, as in sketch 4. All window spaces to be

painted black; all imitation carvings, gold.

Below the waterline paint the body of the hull white; above the waterline all the hull except the carved work is black, a matt black for preference.

For our name plate take a piece of Bristol board to the size of our panel, and with a fine brush, paint the name Royal Sovereign, afterwards going round the edges with a mapping pen and indian ink.

You will find this method produces a good name plate. It is the simplest way to produce good lettering, as most types of gold paint run slightly and it is difficult to get clean cut letters. It only remains to fill in the background to your letters in black with either pen or brush and glue your name plate in position.

I have found 'Ardenbrite' metallic gold paint is most effective for ship models.

The beakhead bulkhead we find from Heywood was decorated by six carved figures, three on either side of the centre doorway to which a short set of steps led.

These figures can be copied by four strips of plastic wood, worked up as for your panels.

For those who want a simple method of imitating carved work here is a tip from a modeller abroad.

Purchase a packet of embossed paper d'oylies and cut out portions of small designs. When glued in position and gilded, the result is very effective for small models.

In our next and last part of this article I will deal with the affective rigging of our model.

## A Model Tram Builder



(Photo by Courtesy of the Kentish Times)

HERE is another type of model which its builder finds fascinating and popular. Mr. R. Elliott of 51 Glenview, Abbey Wood, is an expert at making model trams, and is now at work designing and making one for the Festival of Britain. These trams are now fast disappearing off the roads and we are preparing a design for publication later, so readers may have a reminder of them.



# How art, industry, commerce and warfare are assisted by INQUISITIVE CAMERAS

**I**F you were to put the following question to the next 20 persons you meet and, out of sheer curiosity, recorded their answers you would possibly be surprised to find how very few people really realise the important part photography is taking in our everyday life. Put the question to yourself and before reading this article, give your own reply and then see whether your own knowledge and observations render an adequate appreciation of the wonderful and valuable achievements of the camera and its many and varied applications.

## A Little-known Subject

What is the work of a camera? That is the question in its simplest form and many of your 20 friends will immediately think of it as the apparatus used by a professional photographer in his studio. Others will say they use it on their holidays for taking snapshots. One or two might suggest that it is used by pressmen for getting records of current events. You might also receive a reply to the effect that it is used for shooting cinema films.

Those are the sort of answers you will be given by the great majority. If there is a very keen and enthusiastic amateur amongst your score of friends, he or she might go much farther and, perhaps, give a very interesting response. Generally speaking, however, the man in the street has never allowed his imagination to wander into the almost illimitable areas in which the camera is doing important work.

## Air War Work

We know of the extraordinary reconnaissance work of the Air Force during the last war. How, by means of their cameras, the results of their efforts could be checked. That very practical help of the movements of the enemy could be passed on to the army or navy. That they could penetrate all the dodges of camouflage, detect the presence of submarines and many other items of immense value in the conduct of the war.

One firm of film manufacturers claimed to have supplied so much film for war services, that if it was joined up, there would be sufficient to encircle the world about three times!

## Over Distances

Do you know that the cameras which our men carried on the planes were so supremely good that it was possible to make an exposure from three miles up over a district and the enlargement made from the negative would be so sharp and clear in its definition that one could almost look down the factory chimneys? Distance is no bar to the inquisitive lens.

A few years ago it was considered unique to display a photograph taken from the air of a factory or works. But this was eclipsed when whole suburbs or districts were so treated and, because these proved so accurate, whole countries have now been surveyed in this way. In the course of this work agriculture has received considerable help as to the suitability of certain districts for the growing of crops, etc. Also archaeological research has benefited for the remains of ancient towns and sites have been located, long since hidden from the human eye by the dust of ages but not so from the inquisitive eye of the camera.

Writing of long distances reminds us that photography has revealed much to the astronomer. It has been said that the human eye can only see about 10,000 stars, but the camera has managed to find something like a hundred thousand million. It has traced planets and comets in their courses; the mountains of the moon and the corona of the sun have been recorded on photographic plates for the use not only of the present day astronomers in their work, but for those who follow them in future generations.

Stars close to the sun and quite invisible to the eye of man have been nosed out and their record is now placed with many millions of other record plates held in the libraries of the observatories and universities throughout the world.

## Telephotography

Telephotography for the taking of distant and inaccessible objects has long been of service to geographers, topographers, explorers and others interested in procuring permanent records of contours, mountains, geological deposits and even the crater interiors of volcanoes.

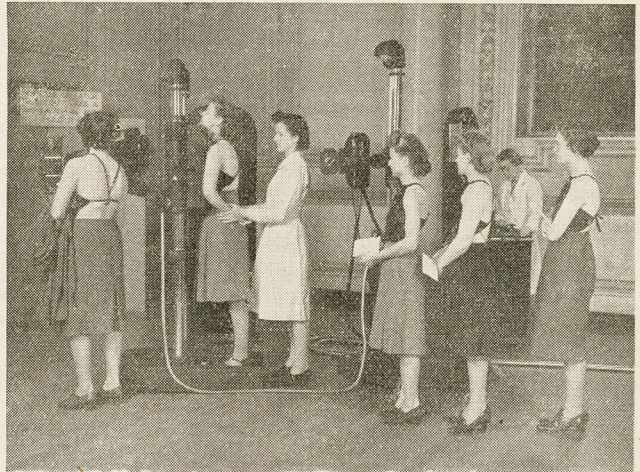
Naturalists have gained much knowledge of the habits of birds and animals in their native haunts and have given the world some wonderful and instructive photographs resulting from their exposures.

Let us now turn our attention to the

small things which are to be found under our very noses yet are invisible, or almost so, to the naked eye. Photo-micrography is the medium by which biologists, medical students and other interested persons have learned and are learning much for the benefit of mankind generally.

## Microscopic

When the microscope is used in conjunction with the camera there seems



Industrial X Ray chest examination undertaken in mass miniature radiography  
Photograph by Ilford Ltd.

to be no limit to the information which it will reveal. Disease in plant and animal life can be traced and prevented. Medical men can follow the development of bacteria from its inception to maturity, watching and recording all its activities during every movement and stage in its existence, be that short or long. At the same time they obtain results that are of infinite value in the laboratory research work, for they can be used to prove the efficacy or otherwise of the many tests and experiments that are made for destroying the germs or preventing their propagation and possibly their complete extermination.

## In Minerals

Who can estimate the value of such work? We might take this a step further and recall that photo-micrography is a very useful help to the metallurgist in his examination of ores and native metals for discovering percentages of other and inferior metals or foreign bodies. This is very necessary work where a high quality of pure metal is required in the finished product. These are just one or two examples of where the inquisitive eye of the camera can see what the human eye cannot.

Inquisitive? Yes very. Why, it will even pry into your own body and reveal to a surgeon exactly where and what your trouble is, so he can make quite a



small incision, instead of one of several inches as in the days before radiology. Thus he can get straight down to it and make such a highly successful job, that before you know where you are, you are out of the hospital and on the road to recovery.

### Radiography

Radiography is akin to photography and resembles it in many respects. It is impossible to say how many lives have been saved through the instrumentality of X-Rays, but we do know that if it had been in use during the South African war, in the same efficient manner as it was during the 1914/18 war, we should have been able to prevent at least 60 per cent of the deaths through wounds. Today it is possible to insert to the stomach a special camera so that exposures can be made of the affected parts. One might call it nosing into the innermost parts.

Radiology is also prominent in other directions. It will locate a flaw in a piece of steel, reveal foreign bodies in food-stuffs, make an accurate recording of the composition of a lump of coal or other mineral and prove the genuineness or otherwise of your jewellery.

### Industrial Plans

During the last few years the camera has butted into many other spheres of life particularly in industry. The following two examples will serve to prove its worth. In an aeroplane there are about 6,000 parts made of aluminium alloy and cut from templates.

Normally such templates are laid out manually from blue-prints. Messrs. Kodak devised a photographic means of producing these direct on the metal from which the part is to be made, and it is estimated that this saved approximately £5,000 per model and shortened the time between designing and the test flight by from two to four months.

### On Productivity

Some few years ago in a large factory where a number of girls were employed on hand work it was noted that the output per girl varied considerably and that some always produced more than others. To reach a solution of this variation a cine operator was engaged and the girl whose output was most consistent, and who always seemed less fatigued was supplied with two small electric lamps one on each wrist.

A length of film was then exposed on her hands while she was doing her work. The lights were then transferred to others who were not quite so good and several film strips exposed. When these were developed they showed that the best girl made far less movements with her hands than the others and that the movements were more methodical. Her film was used eventually for demonstrating to the other workers what movements to avoid and the ultimate result was a very large increase in the daily output.

Photography can be useful also as a sales agent. A firm of engineers specialising in transporter machinery have, in

the course of many years had to produce many types of machines and of various patterns and have found the camera most useful for making records of each piece of plant. Prints are made and numbered, filed and indexed. When a piece of a machine is required, the print of a piece showing similar requirements is sent to the interested party and usually results in an order being received. The specification bearing this indexed number is then turned out and work proceeds without making new designs and plans.

### For Engineering Work

Engineering, however, is not the only industry inquisitively attacked by the camera. It is in evidence in shipbuilding, locomotive assembling works and those where automobiles are massed produced. Wherever constructional or planning is a daily occupation there is usually a darkroom for the photographer. Architects and many other professional men constantly have recourse to the cameraman and it is well

known that advertising agencies recognise its immense value and importance as do also those responsible for new fashions in clothes and decorations.

### Press Pictures

When you open your newspaper in the morning the first thing you note is that the camera has been nosing around again. What a marvellous change has developed in press illustrations. To realise this one should take a look at some of the illustrated papers of the last century. For example one showing the finish of the Derby with three or four of the horses passing the winning post, each with its four legs outstretched to their full extent. Very different and far less truthful than the actual photographic reproductions with which we are now so familiar. In these days, too, the camera is sometimes called upon to corroborate the judges decision—a case of eye versus lens.

(To be Continued)

## The final letters of our series— Photographic Alphabet

### X-Ray Photography

THIS is a very interesting and useful branch of camera craft. X-rays or Röntgen rays were discovered by Professor Konrad Wilhelm Röntgen in the year 1895, and they have the property of passing through an apparently opaque substance and affecting a photographic plate on the other side.

They are largely used in medical work, as while they make skin transparent, they show up as dark lines the bone structure and as dark areas, growths and such like. Thus the nature of a fracture can be studied or the exact position of a growth placed.

X-raying has now become a very precise science and there are many good openings for trained radiologists in our hospitals. The rays are also being used increasingly in the commercial world for testing materials.

### Yellow Safe-light

A 'SAFE-LIGHT' is an illuminant in which a photographic material can be handled without becoming 'fogged'. In other words a light which has no effect upon it at all. With different emulsions (the sensitive layer on film and papers) different coloured lights have to be used as they are not all insensitive to the same part of the spectrum. Thus 'ordinary' film and plates are not sensitive to red, so they can safely be developed by the light of a ruby lamp and this is the colour we usually associate with dark-room work.

Panchromatic film and plates are sensitive to red, and a dull green is the

only light in which they can be handled without danger of fog. So the panchromatic 'safelight' is of this colour.

Bromide paper, however, while being quite sensitive, is not so receptive as plates and this can be safely worked in a yellow light. White light would cause a greying in and red is deeper than is required, but yellow has been proved just right.

Yellow is a very comfortable light to work in as one can see everything about the room quite comfortably—which is certainly not the case with red or green safe lights. Most dark-room lamps have yellow and red glass panels in front, the red one being removed when working with bromide paper.

With regard to 'safe-lights' in general. Photographic materials of every kind are really to some degree sensitive to all lights, so even when using a safe-light, do not have it too bright or too near the material and let inspections near the lamp be as brief as possible.

### Zeit

THIS is a camera marking sometimes shown as 'Z', which you may come across if you happen to get hold of a German-made camera with German inscriptions. Zeit means 'time' and the 'Z' marking is equivalent to our 'T'.

That is, if you place the pointer on the front of the camera to 'Z' and press the trigger the shutter opens and remains open till you press again. Thus the 'Z' marking is for giving time exposures, with the camera on a tripod or some other rigid support.



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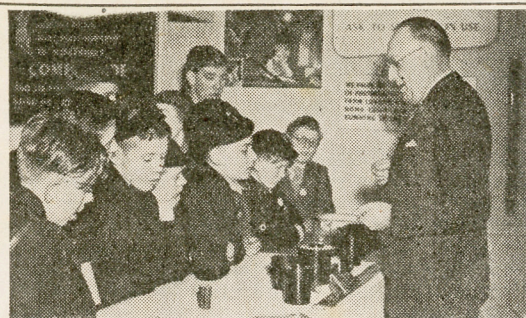
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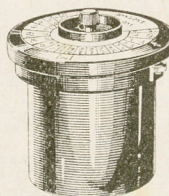
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